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THE ROLE OF LEADERSHIP IN SELF-SYNCHRONIZED OPERATIONS –
IMPLICATIONS FOR THE U.S. MILITARY

by

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A paper submitted to the Faculty of the Naval War College in partial satisfaction of the requirements of the Department of Joint Military Operations.

The contents of this paper reflect my own personal views and are not necessarily endorsed by the Naval War College or the Department of the Navy.

Signature: _____

9 February 2003

Professor Pat Sweeney
Joint Military Operations

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Operation ALLIED FORCE demonstrated the disparity between the leadership skills currently valued in the U.S. military and those required for success in self-synchronized operations. The analysis discusses the reasons for the disparity and presents implications for the U.S. military. It concludes that future multinational operations may impose constraints that preclude self-synchronization and network-centric warfare, and that the culture change envisioned by advocates of network-centric warfare must include realignment of leadership skills to match those required in self-synchronized operations.

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INTRODUCTION

In a January 2003 article published in *Proceedings*, Naval War College professor Dr. Milan Vego described network-centric warfare (NCW) as “a new orthodoxy—a set of beliefs that cannot seriously be challenged.”ⁱ NCW has emerged as a key element of military transformation over the past several years. The Office of Force Transformation recently released a “primer” on NCW “that places this approach to military operations in the center of efforts to revamp the military for the 21st century.”ⁱⁱ Many systems that support NCW are technologically mature, and advocates argue that NCW “is more about changes to process and culture than it is about technology. Significant doctrine and leader development changes are still needed.”ⁱⁱⁱ The importance given to NCW emphasizes the need to thoroughly analyze it to ensure we fully understand its benefits and limitations.

This paper examines self-synchronization—a critical component of NCW—and the role of leadership required in self-synchronized forces. It identifies three leadership skills—the ability to delegate authority, the ability to communicate a clear commander’s intent and the ability to tolerate risk—as essential to success in self-synchronized operations and argues that self-synchronization is incompatible with the leadership philosophy currently valued in the U.S. military.

This study first defines self-synchronizations and describes its role in NCW. It then analyzes the role of the leadership in a self-synchronized environment and identifies key traits required for success in such an environment. Using the NATO operation in Kosovo, ALLIED FORCE, as a case study, it examines why recent commanders failed to demonstrate the leadership skills essential to self-synchronization, despite operating in a technological environment capable of supporting network-centric warfare.

WHAT IS SELF-SYNCHRONIZATION?

VADM (retired) Arthur K. Cebrowski, director of Force Transformation and a long-standing champion of network-centric warfare, has described *self-synchronization* as “the ability of a well-informed force to organize and synchronize complex warfare activities from the bottom up.”^{iv} The success of self-synchronization hinges on three prerequisites:

- Doctrine that is well understood by forces trained in its use;
- Communications among the units that self-synchronize; and
- A clear commander’s intent containing the rules and conditions under which self-synchronization can occur.^v

Self-synchronization replaces traditional top-down, command-directed synchronization.

NCW proponents argue that self-synchronization will overcome “the loss of combat power inherent in” traditional synchronization and transform “combat from a step function to a high-speed continuum.”^{vi}

Self-synchronization facilitates speed of command, the process by which forces use information superiority to lock in success while locking out enemy strategies.^{vii} “Self-synchronization is perhaps the ultimate in achieving increased tempo and responsiveness.” The combination of a rule set, describing the desired outcome, and shared awareness, providing a method to understand the dynamics of a situation, allows forces to operate without a traditional hierarchical command and control mechanism.^{viii} In summary, self-synchronization will allow forces, empowered by good situational awareness, to “recognize and act on a situation without further direction.”^{ix}

THE ROLE OF LEADERSHIP IN SELF-SYNCHRONIZED OPERATIONS

Leadership is an intricate and difficult process. It is both an organizational function—the process of command in military organizations—and a personal quality—a combination of innate qualities and skills.^x Self-synchronization appears to stand traditional notions about command and leadership on their head. Self-synchronized forces organize from the bottom up; they take action without further direction. These features raise questions about the role of the commander and leadership. The term “self-synchronization” suggests independence; self-synchronized forces *will* require greater freedom to act. But self-synchronization does not mean autonomous operations. Admiral Cebrowski has emphasized this point: “self-synchronized operations are independent and rapid, but they are *controlled*.”^{xi}

In fact, self-synchronization relies heavily on the commander and the leadership he provides. The prerequisites for self-synchronization include a clear commander’s intent, derived from the commander’s vision for an operation. Self-synchronization and network-centric warfare do not minimize or eliminate the importance of the commander, but they demand he possess certain skills and capabilities. The most important of these skills are the ability to delegate, the ability to communicate a clear intent, and the ability to accept and cope with risk. This list does not supercede the importance of character traits—such as honesty, integrity, and courage—common to great leaders. Nor does it eliminate the importance of other leadership skills. It simply states those leadership skills considered most essential to self-synchronized operations.

Ability to delegate. Self-synchronized forces organize from the bottom up; they use shared awareness to identify and act on situations *without further direction*. In other words,

the commander must delegate authority to act to subordinate forces. He exercises control through his commander's intent and negation. Shared awareness allows the commander to monitor the actions of subordinate forces and intervene if he doesn't agree with their actions.^{xii}

Commander's Intent. The commander's intent represents the cornerstone of self-synchronization—a critical perquisite whose absence makes self-synchronization impossible. The commander's intent explains why military action will be undertaken, describing the desired end state and telling when self-synchronization can occur.^{xiii}

Joint Publication 3-0, *Doctrine for Joint Operations*, defines commander's intent as a description of the desired end state, a brief expression of the operation's purpose. Commander's form their intent from their analysis of the mission assigned to them. Intent provides the “impetus for the entire planning process.” It “provides focus for all subordinate elements” and “helps subordinates pursue the desired end state without further orders, even when operations do not unfold as plan.”^{xiv} The commander's intent may also include a potential sequence of actions by force elements; an analysis of risk, including a discussion of areas in which the commander is willing to accept risk; the anticipated posture of force elements for future operations; and an assessment of the adversary's intent.^{xv}

Self-synchronization relies on the ability to *recognize* a situation, so the commander's intent must provide tools that, along with good situational awareness, facilitate recognition. Improved situational awareness will allow forces to recognize many situations; it is critical that they select and act on the correct ones. Simply put, forces must understand the commander's priorities. Thus, the commander's intent must identify the enemy's critical factors, center of gravity and decisive points.^{xvi}

Ability to accept risk. Military operations always involve risk, and self-synchronized operations limit the commander's ability to directly control this risk. Commanders who wish to reap the benefits of self-synchronization must also accept the risk that subordinate forces, acting on situations without further direction, may fail. Of course, the commander has tools to minimize risk. By providing a clear intent that establishes priorities and areas in which he is willing to accept risk, the commander gains confidence that subordinate forces will take actions consistent with his vision. Judicious use of command by negation allows the commander to redirect subordinate forces when they act contrary to his vision.

Self-synchronized operations also require an ability to tolerate risk because they anticipate and rely on nonlinearity:

Future operations will be non-linear in space, time, and intensity. There may be no lines to organize forces in the battlespace--no forward line of troops, forward edge of the battle area, or fire support coordination line. Without lines, even the notions of front, rear, and flanks have little meaning. Non-linearity in *time* means that operations need not be undertaken sequentially; they can be mounted in parallel, simultaneously, and continuously. Operational pauses will be rare.^{xvii}

NCW anticipates this type of spatial and temporal non-linearity, and a second type in which “events don’t happen in an orderly, linear, predictable progression, and where outcomes are disproportionate to the changes made in the variables of a given situation.”^{xviii} Of course, this second type of non-linearity is not unique to NCW. Clausewitz clearly described how fog and friction create chaos on the battlefield. “*On War* is suffused with the understanding that every war is inherently a nonlinear phenomenon, the conduct of which changes its characters in ways that cannot be analytically predicted.”^{xix} Network-centric warfare seeks to capitalize on the fog of war; non-linearity and chaos offer the hope that relatively smaller forces might be able to defeat larger enemies by exploiting that chaos.^{xx} Self-synchronization is the tool that will allow commanders to turn chaos to their advantage, but

such operations introduce greater uncertainty, thus involve greater risk. The success of self-synchronization hinges on the commander's ability to accept and tolerate this risk.

Self-synchronized operations will require commanders who possess these abilities, but they may prove inconsistent with the leadership skills currently valued in the U.S. military. Operation ALLIED FORCE (OAF) provides a useful case for comparing the required abilities to those demonstrated by senior leaders in recent operations. ALLIED FORCE is especially relevant because it was conducted in a technological environment capable of supporting network-centric warfare. Several organizations have analyzed the operation and published their observations and lessons learned, and, though recent, it can be viewed with some historical distance

CASE STUDY: OPERATION ALLIED FORCE

Background. Beginning in March 1999, military forces of the North Atlantic Treaty Organization (NATO) conducted a 78-day air operation to compel Yugoslavia to end Serb violence against Albanian Kosovars, withdraw its forces from Kosovo, accept an international military presence in the province, and allow the unconditional return of refugees.^{xxi} From a technological perspective, OAF was conducted in a net-centric environment. Consider General Short's description of the Combined Air Operations Center (CAOC):

On any given day that we were fighting . . . you could walk into that room at any point in time and see live Predator video, live Hunter video, download of near-real-time U-2 [pictures], real-time products from JSTARS [Joint Surveillance Target Attack Radar System], real-time products from RC-135 [Rivet Joint], [Lt. Gen.] Jay Hendrix's field artillery spotters in Albania telling us where the mortars were coming from with their radar capability and what Serbs were doing with their field artillery, and then someplace in a corner we were getting cell phone calls from some guy in the KLA [Kosovo Liberation Army], who was calling on an open-line cell phone to tell us there were 15 bad guys moving down a road 10 miles south of Pristina.^{xxii}

In addition, commanders made frequent use of the video teleconference (VTC) to coordinate activities.

General Wesley Clark, USA, served as overall commander, dual-hatted as both Supreme Allied Commander Europe (SACEUR) and Commander-in-Chief, U.S. European Command (USEUCOM). Lieutenant General (USAF) Michael C. Short, served as the Air Component Commander (JFACC).^{xxiii} OAF was envisioned, planned and executed using only air power. Based on their experience with Yugoslav President Slobodan Milosevic during the 1995 Bosnia crisis, NATO political leaders expected a brief bombing effort and rapid capitulation. Hesitant plans for ground operations started once it became clear that Milosevic would not quickly bow to NATO demands.^{xxiv}

Delegation of Authority. Little delegation of authority occurred in OAF. An “array of authorities” rigidly controlled target selection, including permanent representatives on the North Atlantic Council, SACEUR, air planners in Allied Forces Southern Europe, and authorities in countries hosting NATO aircraft.^{xxv} When Milosevic didn’t rapidly capitulate, NATO expanded its effort and began to attack Yugoslav forces in Kosovo. “For lack of a more appropriate term, the U.S. Air Force usually called attacks on Yugoslav forces in Kosovo ‘close air support,’ although there were no friendly ground forces to support. Aircraft providing ‘close air support’ flew at least 15,000 feet above ground level until [the JFACC] or his representative gave approval to expend ordnance and the strike aircraft was handed off to a tactical air control party or airborne forward air controller.”^{xxvi} These examples illustrate the degree to which commanders maintained centralized control during OAF.

Commander's Intent. On March 23, 1999, General Clark held a VTC with subordinate commanders and staffs in which he formally announced receipt of the NATO execute order. During this VTC, General Clark shared his vision for the upcoming operation. First, he noted that this was “the first time NATO’s ever done something of this magnitude.” He observed that NATO had ground forces at risk in neighboring countries, and had “an indefinite duration for this operation.” He estimated that Milosevic would not have a “sudden change of heart,” and that NATO would “proceed with this operations as planned and we’re going to sharpen it and refine it with each successive day.” General Clark envisioned an extended operation and recognized the need to “move the campaign along some general paths, in addition to minding the legal constraints in the order.” He “defined three military ‘measures of merit’ that guided the conduct of the air operation:”

- Minimizing the loss of friendly aircraft
- “Impacting Serb military and police in Kosovo”
- Minimizing collateral damage

He also defined a fourth political measure of merit: “retain Alliance solidarity and the full support of our regional partners.”^{xxvii}

General Clark’s discussion of the upcoming operation addressed some of the items normally associated with a commander’s intent. It somewhat addressed the purpose of the operation—“impacting Serb military and police in Kosovo”—and provided guidance on how the operation would be conducted. However, it failed to address the desired end state, set no priorities and failed to clearly identify the enemy’s center of gravity. General Clark later identified Yugoslav ground forces operating in Kosovo as the enemy’s center-of-gravity. He believed destruction of these forces would convince Milosevic to end the conflict.

Risk Aversion. NATO commanders demonstrated severe aversion to risk throughout OAF. One need look no further than General Clark's first "measure of merit" for evidence. Minimizing the loss of friendly aircraft dominated NATO's actions. It "addressed Mike Short's [JFACC] biggest concern—to prevent the loss of aircrews. It drove our decisions on tactics, targets, and which airplanes could participate." General Clark explained that he was "motivated by a larger political-military rationale," namely the need to protect the air fleet in order to sustain the operation.^{xxviii} Additional evidence comes from General Short's decision to require aircraft to remain above 15,000 feet "where only SA-6 missiles could reach them."^{xxix} He later explained that "the 15,000-foot floor offered our best opportunity to survive [in conjunction with night attack and precision guided weapons], and I continue to believe that."^{xxx}

ANALYSIS

The military commanders in OAF did not demonstrate the leadership characteristics identified as critical to the success of self-synchronization, suggesting a disparity between the leadership skills currently valued in the U.S. military and those required for success in self-synchronized operations. If the U.S. military wants to achieve self-synchronization in future operations, then we must analyze the reasons for this disparity.

The unique nature of OAF. One explanation lay in the unique nature of OAF. It was NATO's first major military operation, and was conducted in a constrained political environment. NATO faced "constant political pressure both internally and from the larger international community to" minimize friendly casualties and collateral damage to civilians (Serbs and Albanian Kosovars alike) and Yugoslav infrastructure, while quickly halting ethnic cleansing. NATO hoped to "bring Yugoslavia into the European family of nations

and therefore did not want to impoverish the country or to embitter its citizens.”

Humanitarian concerns motivated NATO’s military intervention in Kosovo, but none of the NATO governments had vital political, military or economic interests at stake.^{xxx}

General Clark’s political measure of merit—maintaining alliance solidarity—indicated his understanding of the political constraints. Alliance solidarity was NATO’s strategic center-of-gravity. No individual nation could accomplish its political objectives alone. For example, the United States provided the majority of the aircraft used in OAF, but needed basing and over-flight rights from alliance partners to operate.

Political constraints and the need to maintain alliance solidarity affected commanders and influenced their behavior. The clearest manifestation lay in the tortuous process for selecting and approving targets. The involvement of members of the North Atlantic Council and senior commanders in target selection stifled the delegation of authority. Pressure to minimize casualties contributed to the commanders’ aversion to risk, and NATO’s limited goals led to unclear political objectives that hampered the military planning process and contributed to the commander’s inability to define a clear intent.

Political constraints affected the behavior of NATO’s military commanders, and this suggests trouble for the future of self-synchronization. Our national strategy emphasizes the importance of international cooperation.^{xxx} Future military operations will involve coalitions and multi-national partnerships that will bring political constraints. If the need to maintain coalition solidarity requires leadership behaviors inconsistent with self-synchronization, then network-centric warfare cannot succeed.

Failed Planning Process. OAF was politically constrained, but such constraints, and the need to maintain coalition solidarity, were not the sole determinants of the behavior of

military leaders. In OAF, the military planning process collapsed. When the initial effort to compel Milosevic failed, NATO confronted the prospect of a long campaign, but no political foundation existed for protracted conflict, nor had significant military planning been accomplished. Long before OAF began, senior NATO civilian and military leaders ruled out using ground forces as part of an integrated operation to accomplish NATO's objectives in Kosovo. Leaders considered a ground operation risky and unnecessary so planning focused on air and missile strikes^{xxxiii}

The heart of military planning lies in the use of operational art to link a desired end state and strategic objectives into a military strategy with supporting military objectives. This process collapsed in OAF. General Clark's "measures of merit" did not state a clear purpose, beyond *impacting* Yugoslav military and police activities, nor did it articulate a clear end state. NATO planning failed to clearly identify the political and military objectives. In early April, well into the operation, General Clark conducted a private VTC with his senior (four-star) commanders in which he raised fundamental issues: "Were we meeting our military objectives? How were these linked to the political [strategic] objectives? What were the political objectives? What is the end-state? When could we reach it?"^{xxxiv}

During this time, a controversy emerged over the focus of NATO's effort. General Clark directed increased attacks against Yugoslav ground forces operating in Kosovo. He considered these forces Milosevic's center of gravity, believing destruction of these forces would help convince Milosevic to end the conflict. General Short (JFACC) disagreed. He believed NATO should concentrate its air power against strategic fixed targets in Yugoslavia:

“If Yugoslav leaders attacked the Kosovar Albanians, then air power should be directed against leadership targets in Belgrade.”^{xxxv}

In May 2000, General Short gave a speech at an air-and-space symposium in Arlington, Virginia in which he stated that NATO lacked clear political objectives in Kosovo. “We need clear political objectives. ... Men in uniform in the next generation need to know what our political leadership wants to do. And those objectives have to be translated into military objectives, and you and I would like to know what the end states is.”^{xxxvi}

The collapse of the planning process, and the resulting failure to identify political and military objectives or a desired end state led to the incomplete commander’s intent, expressed by General Clark as his “measures of merit.” The limited nature of OAF and vague political objectives hampered the planning process, but General Clark, the combatant commander, had an obligation to define objectives and a desired end state. In describing NATO planning, General Clark recalled a quote from Clausewitz’s *On War* that had been favorite Vietnam critique during his time at the Army Command and Staff College: “No one in his right mind would, or ought to, begin a war if he didn’t know how to finish it.” He goes on to say that “in practice, this proved to be an unreasonable standard. In dealing with complex military-diplomatic situations, the assertion of power itself changes the options. And trying to think through the problem to its conclusions in military terms always drove one to ‘worst-case’ analysis.”^{xxxvii} General Clark apparently felt that defining objectives and a desired end state was just too difficult, but it was his responsibility, as combatant commander, to drive the planning process and apply operational art to define objectives, a desired end state, and a commander’s intent.

Risk Aversion. Risk aversion dominated OAF. General Clark's first "measure of merit" emphasized the importance of preventing or minimizing aircraft losses. "It drove our decisions on tactics, targets, and which airplanes could participate."^{xxxviii} This logic contradicts the principles of war. Military objectives drive decisions about tactics, targets and forces. General Clark explained that his motivation was the "larger political-military rationale" of protecting the air fleet. If NATO suffered excessive losses, "Milosevic could wait us out."^{xxxix}

All military commanders want to minimize losses, and any operation that suffers excessive casualties is more likely to fail. These statements represent nothing more than common sense. General Clark's emphasis on minimizing losses suggests a deeper aversion to risk.

Military operations involve risk, and a commander's ability to accept risk will impact his ability to function in a self-synchronized environment. Different individuals tolerate risk in different ways. An individual's ability to tolerate risk depends on his personality; the stakes involved; demographic variables, such as age, sex and culture; organizational features, such as culture and seniority; experience; and perceptions about responsibility for the outcome.^{xl}

An individual's personality affects his tolerance for risk, but studies show that individuals demonstrate inconsistent risk-taking preferences in different situations.^{xli} In general, personality traits such as introversion, self-consciousness, self-discipline and conscientiousness predict risk aversion, while traits such as extraversion, openness, assertiveness and intellect predict risk propensity.^{xlii} Each list contains traits we value in leaders at different times, thus the selection of leaders able to tolerate the risk of self-

synchronized operations cannot rely on personality traits alone. It should focus on factors, such as organizational influences, more easily controlled.

In general, conservative organizations tend to be more risk-averse than those that encourage or reward risk taking, and military organizations tend to be conservative.^{xliii} Routine, peacetime activities rightly emphasize safety, but over time, this leads to a risk-averse culture. The U.S. military is also plagued by the myth that the American public is unusually sensitive to casualties. In fact, the U.S. public is not intrinsically averse to casualties; the American public considers the costs and benefits of operations and compares the acceptability of casualties to the value of the objective. Public support for military operations depends on national leadership, not on the level of casualties alone. Commanders should not allow concerns about public casualty aversion to affect planning, but should rely on their professional expertise and personal ethics. Predicting casualties is an appropriate area of professional judgment since casualties affect mission accomplishment, but considerations of the social impact of casualties should be left to civilian leaders.^{xliv}

We must also address our organizational attitude towards failure. The military tends to be quite unforgiving of failure, and this contributes to a risk-averse culture. In self-synchronized operations, subordinates may make wrong decisions and fail. The commander must be prepared to accept this risk of failure. The system provides tools to control this risk—such as command by negation—but the commander must ultimately trust his subordinates and accept risk of failure.

CONCLUSION

Operation ALLIED FORCE demonstrates the disparity between the leadership skills currently valued by the U.S. military and those required for success in self-synchronized,

network-centric operations. The preceding analysis of command and leadership during OAF reveals two considerations. First, multinational operations, especially those with limited objectives, can impose significant political constraints that impede delegation of authority, hamper military planning, and accentuate aversion to risk. Second, the joint force commander was unable to communicate a clear commander's intent to his subordinates, a skill critical to self-synchronization. Our ability to reap the benefits of self-synchronization and network-centric warfare in future operations will depend on our ability to address these issues.

Nature of the Operation. OAF was a multinational operation, with limited objectives, conducted by an alliance with varying national agendas. Each nation had unique objectives, values, and ideas about acceptable methods for achieving its objectives. No individual nation, including the United States, could achieve its political objectives alone; thus maintaining alliance solidarity was essential to success. These features restricted freedom of action and inhibited self-synchronization. The variety of opinions obscured NATO's political objectives. Without clear political objectives, the planning process broke down, contributing to the failure to clearly identify a desired end state and hampering the commander's ability to develop and communicate a clear intent. The need to maintain solidarity paralyzed the decision-making process, leading to a tortuous process for selecting and approving targets that stifled delegation of authority. Internal pressure from alliance partners to minimize friendly casualties and collateral damage led to risk aversion. Taken together, these examples illustrate how the nature of OAF—a multinational operation with limited objectives—precluded self-synchronization.

This experience suggests that certain types of operations may hamper a commander's ability to employ the leadership skills required for self-synchronization. As we advance the concept of network-centric warfare, we must remain mindful of this potential incompatibility and its implication on choices we will confront. If the accomplishment of future political objectives requires multinational military operations, and if the nature of the alliance or coalition introduces political constraints that prevent the commander from using the skills required to achieve self-synchronization, then we cannot expect self-synchronization to occur or network-centric warfare to succeed.

Leadership Skills. In OAF, the combatant commander failed to communicate a clear commander's intent and demonstrated intolerance for risk inconsistent with self-synchronization. The nature of the operation contributed to these failures, but such failures also have a human aspect that can just as readily doom self-synchronization in operations whose nature supports it. In other words, the difficulty of the situation encountered by General Clark does not fully explain his failure to establish a clear intent or demonstrate a suitable tolerance for risk. He failed to define clear objectives and a desired end state, prime responsibilities of a combatant commander. This contributed directly to his inability to state a commander's intent with sufficient clarity to support self-synchronization. He allowed risk, rather than objectives, to drive decisions about tactics, targets and methods. Self-synchronized operations require commanders with the ability to tolerate risk. If future commanders cannot state a clear intent or tolerate risk, self-synchronization will not occur, and the U.S. military will not realize the benefits of network-centric warfare.

Admiral Cebrowski has argued that network-centric warfare requires a change of culture within the U.S. military. Our experience in OAF demonstrates that this new culture

must include leaders who possess the skills required for success in self-synchronized operations. These new leaders must have the ability to delegate authority; they must understand their role in the planning process and have the ability to develop and communicate a clear commander's intent; and they must squelch the risk aversion that dominates today's force and develop the ability to tolerate the risk associated with self-synchronized operations.

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ENDNOTES

ⁱ Milan Vego, "Net-centric is Not Decisive," United States Naval Institute Proceedings, 129 (January 2003): 52.

ⁱⁱ Keith J. Costa, "Office of Force Transformation Unveils Primer on Network-Centric Warfare," InsideDefense.com (January 6, 2004): 1.

ⁱⁱⁱ Megan Scully, "Iraq War Proves Power of Net-Centric Vision," Defense News (January 26, 2004): 1.

^{iv} Arthur K. Cebrowski and John J. Garstka, "Network-centric Warfare: Its Origin and Future," United States Naval Institute Proceedings, 124 (January 1998): 35.

^v Arthur K. Cebrowski, "Network-centric Warfare: An Emerging Response to the Information Age," presentation to the 1999 Command and Control Research and Technology Symposium, 29 June 1999, 4.

^{vi} Arthur K. Cebrowski and John J. Garstka, "Network-centric Warfare: Its Origin and Future," 35.

^{vii} Arthur K. Cebrowski and John J. Garstka, "Network-centric Warfare: Its Origin and Future," 35.

^{viii} David S. Alberts, John J. Garstka, and Frederick P. Stien, *Network Centric Warfare: Developing and Leveraging Information Superiority* (Washington, DC: DoD C4ISR Cooperative Research Program, 1999), 166-7. Please note that this citation includes the quotation in the previous sentence.

^{ix} Arthur K. Cebrowski, "Network-centric Warfare: An Emerging Response to the Information Age," 4.

^x *Army Command and Management: Theory and Practice* (Carlisle Barracks, PA: U.S. Army War College, 1988), 5-1/2.

^{xi} Emphasis added. Arthur K. Cebrowski, "Network-centric Warfare: An Emerging Response to the Information Age," 4.

^{xii} Ibid. Quoting VADM (ret.) Cebrowski: "Greater speed of command means greater automation of some warfare activities, and a flatter organizational structure, given that direct access to the information needed to make decisions will be available. Command and control, in this scheme, will largely be conducted on the basis of negation. For this reason, the quality and timeliness of the commander's intent have become of ever increasing importance."

^{xiii} Ibid. Admiral Cebrowski stated that a clear commander's intent "provides the conditions and rules under which self-synchronization can and cannot occur."

^{xiv} Joint Chiefs of Staff, *Doctrine for Joint Operations*, Joint Publication 3-0 (Washington, DC: 10 September 2001), III-26. Note this citation refers to paragraph, including embedded quotations.

^{xv} Joint Chiefs of Staff, *Joint Doctrine for Campaign Planning*, Joint Publication 5-00.1 (Washington, DC: 25 January 2002), III-8.

^{xvi} Critical factors include *critical strengths* – those capabilities considered vital for the accomplishment of a given objective – and *critical weaknesses* – those sources of power essential to the accomplishment of an objective but inadequate to perform their intended function or task. Critical vulnerabilities are those critical strengths or weaknesses that can be made vulnerable to attack. The center of gravity is a source of strength whose degradation or destruction would have the most decisive impact on the enemy's own ability to accomplish a given objective. Decisive points are key events or locations whose control gives a commander a marked advantage over the enemy. Decisive points are the keys to attacking the enemy's center of gravity. Please refer to Milan Vego, *Operational Warfare*, 307-316 and Joint Publication 3-0, *Doctrine for Joint Operations*, III-20/21.

^{xvii} Arthur K. Cebrowski, "Network-centric Warfare: An Emerging Response to the Information Age," 4.

^{xviii} Erik J. Dahl, "Network Centric Warfare and the Death of Operational Art," (Unpublished Research Paper, U.S. Naval War College, Newport, RI: 2001), 17.

^{xix} Alan Beyerchen, "Clausewitz, Nonlinearity, and the Unpredictability of War," International Security, 17 (Winter 1992-93): 61. Quoted in "Network Centric Warfare and the Death of Operational Art," (see previous citation).

^{xx} Erik J. Dahl, "Network Centric Warfare and the Death of Operational Art," 17.

^{xxi} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 1999 (Santa Monica, CA: RAND, 2002), 27.

^{xxii} Elaine M. Grossman, "Short: U.S., NATO Lacked Clear Political Objectives in Kosovo War," Inside the Pentagon, (May 25, 2000): 1.

^{xxiii} JFACC refers to Joint Force Air Component Commander, a designation defined in U.S. Joint Doctrine. Lt Gen Short also served as Commander, Air Forces Southern Europe and Commander, 16th Air Force.

^{xxiv} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 21-25.

^{xxv} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 25.

^{xxvi} *Ibid*, 34.

^{xxvii} General Wesley K. Clark, U.S. Army (retired), *Waging Modern War: Bosnia, Kosovo and the Future of Combat* (New York: Public Affairs, 2001), 182-3. See also Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 25.

^{xxviii} *Ibid*, 183.

^{xxix} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 28.

^{xxx} John A. Tirpak, "Short's View of the Air Campaign: What Counted Most for NATO's Success in the Balkans was the Reduction of Strategic Targets, not 'Tank Plinking' in Kosovo," Air Force Magazine (September 1999), 4.

^{xxxi} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*. See pages 2, 33 and 117.

^{xxxii} National Security Strategy of the United States of America, September 2002. For instance, the cover letter to the National Security Strategy states: "The United States is committed to lasting institutions like the United Nations, the World Trade Organization, the Organization of American States, and NATO as well as other long-standing alliances. Coalitions of the willing can augment these permanent institutions."

^{xxxiii} Bruce R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 3. The NATO plan included phases that would permit attacking targets beyond the initial strikes directed at the Yugoslav air defense system. Phase two targets included ground targets in Kosovo; phase three incorporated hostile ground forces throughout Yugoslavia.

^{xxxiv} General Wesley K. Clark, U.S. Army (retired), *Waging Modern War: Bosnia, Kosovo and the Future of Combat*, 233.

^{xxxv} R. Nardulli, *et al*, *Disjointed War: Military Operations in Kosovo*, 33-4.

^{xxxvi} Elaine M. Grossman, "Short: U.S., NATO Lacked Clear Political Objectives in Kosovo War," 1.

^{xxxvii} General Wesley K. Clark, U.S. Army (retired), *Waging Modern War: Bosnia, Kosovo and the Future of Combat*, 167.

^{xxxviii} *Ibid*, 183.

^{xxxix} *Ibid*.

^{xl} For a good discussion of these factors and access to related articles, refer to Risk Propensity Models. 2003. <http://www.riskpsychology.net/RiskAndPreferences/rpmodels.jsp> [20 January 2004]

^{xli} *Ibid*.

^{xlii} *Ibid*.

^{xliii} *Ibid*.

^{xliv} Richard A. Lacquement, Jr, "The Casualty-Aversion Myth," Naval War College Review, 57 (Winter 2004): 39-57.